AC Current Probe
Model MN254 and MN255
User Manual

DESCRIPTION

The MN254/MN255 (Cat. #2115.80/2115.81) are the latest in compact AC Current probes. Designed to meet the most stringent demands in industry and electrical contracting, they also meet the latest safety and performance standards. The probes have a measurement range up to 240 Arms which makes them perfect tools for measurement with DMMs, recorders, power and harmonic meters. They are compatible with any AC voltmeter, multimeter, or other voltage measurement instrument that is capable of displaying 10mV of output per amp of measured current, voltmeter accuracy of 0.75% or better and an input impedance of ≥ 1 MΩ.

WARNING

These safety warnings are provided to ensure the safety of personnel and proper operation of the instrument.

- Read the instruction manual completely and follow all the safety information before attempting to use or service this instrument.
- Use caution on any circuit: Potentially high voltages and currents may be present and may pose a shock hazard.
- Read the specifications section prior to using the current probe. Never exceed the maximum voltage ratings given.
- Safety is the responsibility of the operator.
- ALWAYS connect the current probe to the display device before clamping the probe onto the sample being tested.
- ALWAYS inspect the instrument, probe, probe cable, and output terminals prior to use. Replace any defective parts immediately.
- NEVER use the current probe on electrical conductors rated above 600V in overvoltage category III (CAT III). Use extreme caution when clamping around bare conductors or bus bars.

INTERNATIONAL ELECTRICAL SYMBOLS

This symbol signifies that the current probe is protected by double or reinforced insulation. Use only factory specified replacement parts when servicing the instrument.

This symbol signifies CAUTION! and requests that the user refer to the user manual before using the instrument.

This is a type A current sensor. This symbol signifies that application around and removal from HAZARDOUS LIVE conductors is permitted.

DEFINITION OF MEASUREMENT CATEGORIES

Cat. I: For measurements on circuits not directly connected to the AC supply wall outlet such as protected secondaries, signal level, and limited energy circuits.

Cat. II: For measurements performed on circuits directly connected to the electrical distribution system. Examples are measurements on household appliances or portable tools.

Cat. III: For measurements performed in the building installation at the distribution level such as on hardwired equipment in fixed installation and circuit breakers.

Cat. IV: For measurements performed at the primary electrical supply (<1000V) such as on primary overcurrent protection devices, ripple control units, or meters.

RECEIVING YOUR SHIPMENT

Upon receiving your shipment, make sure that the contents are consistent with the packing list. Notify your distributor of any missing items. If the equipment appears to be damaged, file a claim immediately with the carrier and notify your distributor at once, giving a detailed description of any damage.

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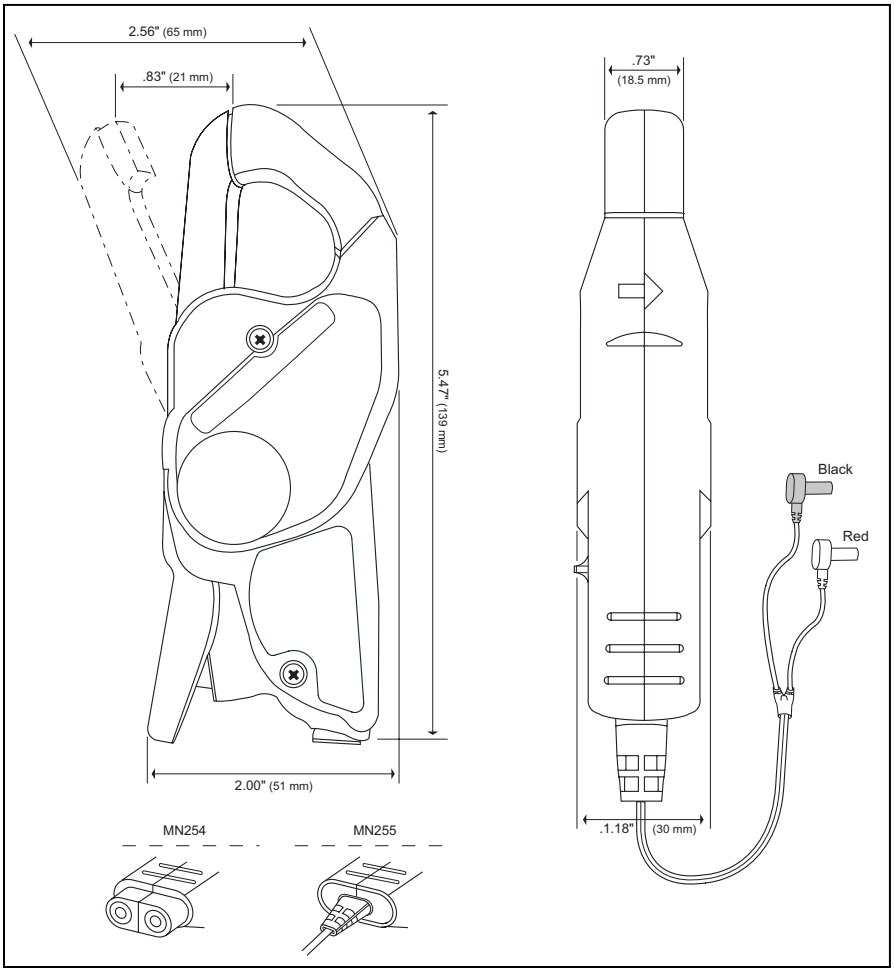

ELECTRICAL SPECIFICATIONS

Nominal Range: 20A, 200A

Measurement Range: 20 A: 0.1 to 24 A
200A: 0.1 to 240 A

Transformation Ratio: Voltage output

Output Signal: 20 A: 100 mV/A
200 A: 10 mV/A

Accuracy and Phase Shift*:

20 A Range
Accuracy: 1% ± 50 mV
Phase Shift: Not specified

200 A Range:
Accuracy: 0.5 to 10 A: 3.0% Reading ± 5 mV
10 to 40 A: 2.5% Reading ± 5 mV
40 to 100 A: 2.0% Reading ± 5 mV
100 to 240 A: 1.0% Reading ± 5 mV

Phase Shift: 0.5 to 10 A: Not Specified
10 to 40 A: ≤ 5°
40 to 100 A: ≤ 3°
100 to 240 A: ≤ 2.5°

(*Reference conditions: 18°C to 28°C, 20 to 75% RH, external magnetic field <40 A/m, 48 to 65Hz sine wave, distortion factor less than 1%, no DC component, no

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Frequency Range: 40 to 10 kHz

Limit Operating Conditions:
200 A permanently to 1 kHz; Derating above 3kHz: 200 A x (1/0.333 F), F in kHz

Crest Factor:
3 @ 200 Arms with an error (due to CF) of 3%

Working Voltage: 600 Vrms

Common Mode Voltage: 600 Vrms

Influence of Adjacent Conductor:
< 15 mA/A at 50 Hz

Influence of DC on AC signal:
20 A Range: DC Current < 2 A, < 0.5%
200 A Range: DC Current < 20 A, < 5%

Influence of Conductor Position in Jaw:
0.5% of mV output @ 50/60 Hz

Influence of Frequency:
20 A Range:
40 Hz to 1 kHz: 5% of mV output
1 kHz to 10 kHz: 15% of mV output

200 A Range:
40 Hz to 1 kHz: 3% of mV output
1 kHz to 10 kHz: 12% of mV output

Influence of Temperature:
≤ 150 ppm/°K, or 0.15% of mV output per 10°K

Influence of Humidity (10 - 90% RH):
≤ 0.2% of mV output per 10°K @ 18°C to 28°C

MECHANICAL SPECIFICATIONS

Operating Temperature:
14° to 131°F (-10° to +55°C)

Storage Temperature:
-40° to 158°F (-40° to +70°C)

Operating Relative Humidity:
10-35°C 85% RH (without roll-off above 35°C)

Maximum Cable Diameter:
One Ø 0.78" (20 mm), bus bar 20 x 5 mm

Case Protection: IP 40 (IEC 529)

Drop Test:
Test per IEC 68-2-32:
1.0 m drop on 38 mm of Oak on concrete.

Vibration: Test per IEC 68-2-6

Dimensions:
5.47 x 2.00 x 1.18" (139 x 51 x 30 mm)

Weight: 180 g (6.5 oz)

Polycarbonate Material:
Jaws: Polycarbonate with 10% fiberglass charge, Red UL 94 V0
Case: Polycarbonate 920A Gray

Opening Operations - Life: > 50,000

Output:
MN254: Two standard safety banana jacks (4mm)
MN255: Double/reinforced insulated 5 ft (1.5m) lead with safety 4mm banana plug

SAFETY SPECIFICATIONS

c UL us LISTED E192383

Electrical:
Double insulation or reinforced insulation between the primary or secondary and the outer case of the handle conforms to IEC 1010-2-32.

Common Mode Voltage:
600V Category III, Pollution Degree 2

Dielectric Strength:
5550V, 50/60Hz between primary, secondary and the outer case of the handle

Electromagnetic Compatibility:
EN 50081-1 Class B
EN 50082-2 Electrostatic discharge
IEC 1000-4-2
Radiated field IEC 1000-4-3
Fast transients IEC 1000-4-4
Magnetic field at 50/60Hz IEC 1000-4-8

ORDERING INFORMATION

AC Current Probe MN254 .....Cat #2115.80

AC Current Probe MN255 .....Cat #2115.81
Both models include a user manual and a product warranty and registration card.

Accessories:
Leads, set of 2, 5 ft safety
(1000V) for Model MN254..... **Cat #2111.29**

Banana plug adapter

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OPERATION

Please make sure that you have already read and fully understand the WARNING section on page 1.

Making Measurements with the AC Current Probe Model MN254 and MN255

- Connect the black lead of the current probe to "common" and the red lead to the AC voltage input on your DMM or other voltage-measuring instrument. The AC current probe has an output of 10 mV/A and 100 mV/A. This means that with the probe in the 10 mV/A position, for 200 A AC in a conductor around which the probe is clamped, 2 V AC will come out of the probe leads to your DMM or instrument. Select the range which corresponds to the measured current. If the current magnitude is unknown, start with the probe in the 10 mV/A position and if the current is < 20 amps the probe can be switched to the 100 mV/A position for the higher resolution. Clamp the probe around the conductor. With the probe in the 10 mV/A position take the reading on the meter and multiply it by 100 to obtain the measured current (e.g, 160 mV reading = 160 x 100 = 16,000 mA or 16 A).
- For best accuracy, avoid if possible, the proximity of other conductors which may create noise.

Tips for Making Precise Measurements

- When using a current probe with a meter, it is important to select the range that provides the best resolution. Failure to do this may result in measurement errors.
- Make sure that probe jaw mating surfaces are free of dust and contamination. Contaminants cause air gaps between the jaws, increasing the phase shift between primary and secondary. It is very critical for power measurement.

MAINTENANCE:

Warning

- For maintenance use only original factory replacement parts.
- To avoid electrical shock, do not attempt to perform any servicing unless you are qualified to do so.
- To avoid electrical shock and/or damage to the instrument, do not get water or other foreign agents into the probe

Cleaning

To ensure optimum performance, it is important to keep the probe jaw mating surfaces clean at all times. Failure to do so may result in error in readings. To clean the probe jaws, use very fine sand paper (fine 600) to avoid scratching the jaw, then gently clean with a soft oiled cloth.

REPAIR AND CALIBRATION

You must contact our Service Center for a Customer Service Authorization number (CSA#). This will ensure that when your instrument arrives, it will be tracked and processed promptly. Please write the CSA# on the outside of the shipping container. If the instrument is returned for calibration, we need to know if you want a standard calibration, or a calibration traceable to N.I.S.T. (includes calibration certificate plus recorded calibration data).

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
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Tel: (800) 945-2362 (Ext. 360)
(603) 749-6434 (Ext. 360)
Fax: (603) 742-2346 or (603) 749-6309
repair@aemc.com

(Or contact your authorized distributor)

Costs for repair, standard calibration, and calibration traceable to N.I.S.T. are available.

NOTE: All customers must obtain a CSA# before returning any instrument.

TECHNICAL AND SALES ASSISTANCE

If you are experiencing any technical problems, or require any assistance with the proper use or application of this instrument, please call our technical hotline:

(800) 343-1391 • (508) 698-2115 • Fax (508) 698-2118
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